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Identification of  
Generalizable Skills in  
Secondary Vocational  
Programs

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EXECUTIVE SUMMARY





**Identification of  
Generalizable Skills in  
Secondary Vocational  
Programs**

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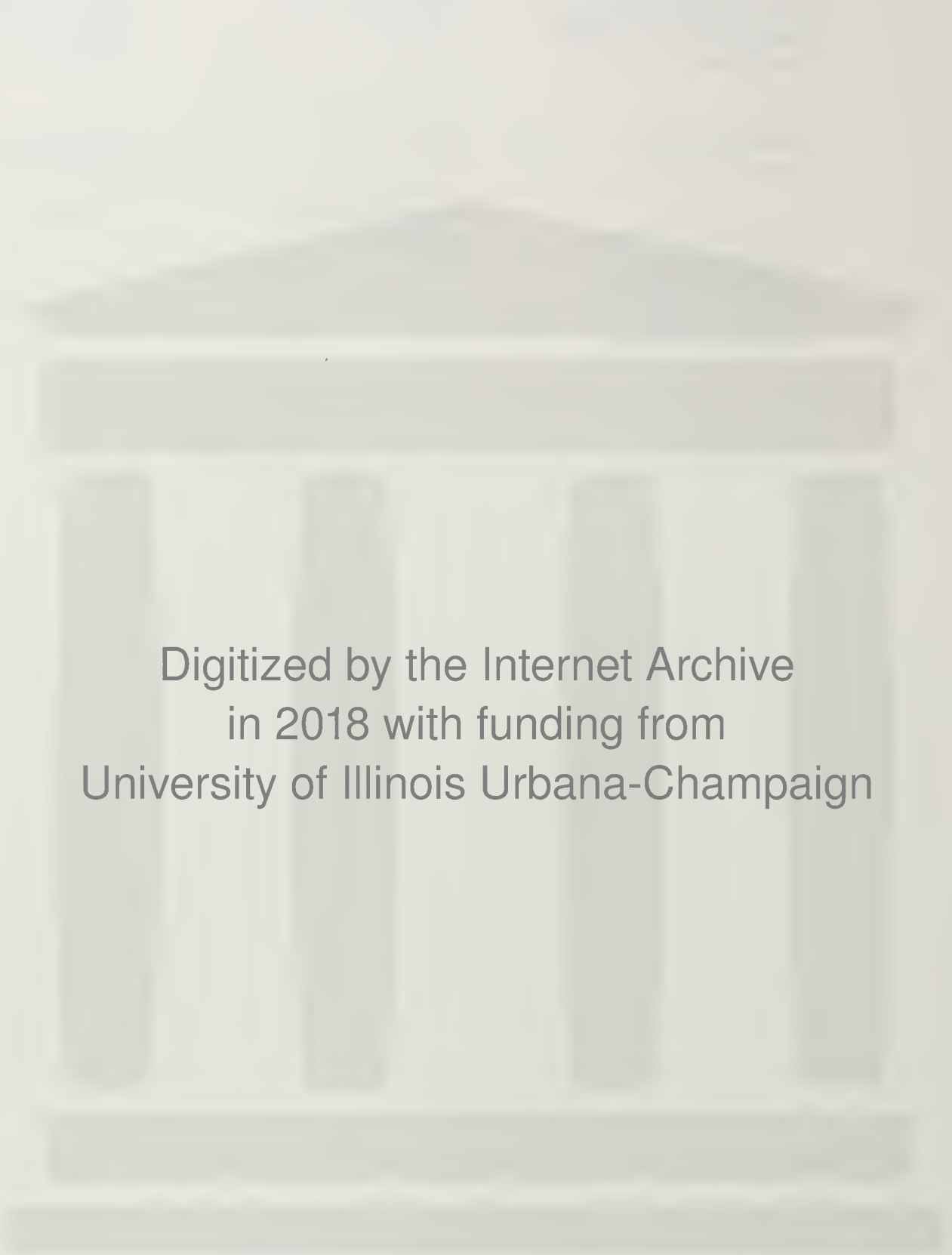
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Department of  
Adult, Vocational  
and Technical  
Education

Research and  
Development Section

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## Introduction

During recent years increased public attention has focused on the skills and abilities needed to participate in our society. Skills required to live independently and to obtain gainful employment have become more emphasized in both educational settings and the world of work. In particular, the field of vocational education has begun to focus attention in the area of basic skills. Acquisition of basic skills is commonly believed to be necessary for success in vocational training programs and occupations.

Several recent studies have focused on the concept of transferable skills as applied to occupations, vocational programs, or skills that differentiate people from one another (McKinlay, 1976; Altman, 1976; Sticht, 1978; Mikulecky & Diehl, 1979; Moe, Rush, & Storlie, 1979; Boyd & Cline, 1981; Moorehouse, 1981; Harding, 1981, Baker, 1981). The concept of transferable or generalizable skills appears to be largely an unmet and important need with significant implications for what and how vocational education is provided in the future. Skills, knowledge, and attitudes involved in vocational training programs and employment settings are learned behaviors and are all potentially generalizable. However, no single, definitive, and agreed upon list exists, but there appears to be considerable consensus on many partial lists. Pratzner (1978) and Ashley and Ammerman (1978) claimed: (a) objective or non-arbitrary criteria do not seem to exist to decide whether one list is better or more valid than another, (b) items on many lists appear to be of equal importance, (c) several skills or attitudes somehow seem non-specific, vague, or reduced to a simple level of specificity, (d) the



lists do not reflect adequately if at all the interrelationships, specificity, richness, and complexity of some skills and combinations of skills, and (e) it is very difficult to cross-reference items in several lists or to combine or consolidate lists. These claims seem substantiated in the present review of literature. In addition, the skills identified in most studies have been drawn almost exclusively from employment settings. Minimal research regarding generalizable skills has focused on vocational training programs or the combined skill requirements of vocational programs and occupations.

Several research studies have reviewed, identified, analyzed, and summarized transferable or generalizable skills and have concluded that there were five skill areas which appear highly generalizable: (a) mathematics, (b) communications, (c) interpersonal relations, (d) reasoning, and (e) manipulative (Sjogren, 1977; Kawula & Smith, 1975; Greenan & Smith, 1981, Greenan, 1982). These skill areas include problem solving, decision making, social skills of work (e.g., work habits, attitudes, and values) and technical skills. Similar skill areas and skills need to be specified and developed to high levels of mastery in students (Pratzner, 1981). Students need to be informed of the skills they have acquired and their level of proficiency, and those skills not acquired or not developed that are necessary for continued training and employment success.

### Purpose of the Study

The central problem investigated in this study was to determine the skill areas and skills that were generalizable within and across the secondary vocational training programs in the 32 area vocational centers (AVC) in the State of Illinois. The specific research problem was to







(a) develop, validate, and determine the reliability of a generalizable skills instrument, and (b) identify which mathematics, communications, interpersonal relations, reasoning skills, and other skills were generalizable within and across all secondary agricultural; business, marketing, and management; health; home economics; and industrial occupations training programs. In order to resolve the research problem the following objectives were developed:

1. Identify and validate a list of skills which is potentially generalizable and related to success in secondary vocational training programs.
2. Construct a survey questionnaire to assess the relative importance of a list of skills as it relates to the content of secondary vocational training programs.
3. Determine the reliability of the Generalizable Skills Importance Questionnaire in terms of internal consistency reliability.
4. Identify the skill areas and skills that are generalizable within and across secondary vocational training program areas and programs.

### Population

The population for this study consisted of the 593 secondary vocational training teachers in the thirty-two (32) AVCs in the State of Illinois. All teachers in each of the five (5) vocational training program areas were chosen to participate and included: agricultural occupations; business, marketing, and management occupations; health occupations; home economics occupations; and industrial occupations.

### Instrumentation

The instrument development process included a comprehensive review of the literature to identify skills in previous research studies. An initial draft list was developed that included four (4) skill areas and 102 skills: (a) 26 mathematics skills, (b) 30 communications skills, (c)



18 interpersonal relations skills, and (d) 28 reasoning skills. The draft list of skills was reviewed by the project advisory committee, survey research laboratory personnel at the University of Illinois, a sample of AVC directors and teachers, and a sample of employers/employees. Based on the reviewers' comments, additions, and/or deletions in terms of content, meaning, clarity, and readability a final list of skills was produced which was (a) perceived to possess both content and face validity, and (b) potentially generalizable and related to success in secondary vocational training programs.

The previously identified list of generalizable skills was used as the basis for writing items and constructing the "Generalizable Skills Importance Questionnaire (GSIQ)." The GSIQ which contained a seven-point Likert-Type scale based on "degree of importance," was designed to survey secondary vocational training teachers in order to determine the skills that were perceived as most necessary or important for students to successfully perform in their respective programs. The GSIQ was also intended to identify skills that were generalizable within and across several secondary vocational training program areas and programs.

The project advisory committee members, survey research laboratory personnel, and a sample of ten (10) AVC directors and teachers reviewed and critiqued the GSIQ. The purpose of this procedure was to (a) identify additional skills, and (b) determine whether the reviewers understood the directions and items in terms of content, meaning, clarity, and readability. Based on the reviewers' comments, additions, and/or deletions, the necessary revisions were made. The final version of the GSIQ was then produced and perceived to possess



both content and face validity, and to be potentially capable of reliably measuring the importance of generalizable skills relative to success in secondary vocational training programs.

### Data Collection

Information regarding the types and number of vocational training program areas, programs, and numbers of teachers were collected from the 32 secondary AVC directors in the State of Illinois. During the fourth week of October, 1982, each of the AVC directors received a cover letter; a GSIQ for each teacher in his center; instructions for distributing, collecting, and returning the GSIQs; and a self-addressed mailing envelope for returning the completed GSIQs. The directors were instructed to distribute a GSIQ to each teacher, collect the GSIQs, and return the completed GSIQs by the third week of November, 1982. At that time, a follow-up telephone call was made to each non-responding director. The data collection process was concluded during the third week of December, 1982. Each of the 32 (100%) AVC directors returned a package of completed GSIQs. Four hundred and eighty-nine (489) or 82.46% of the total number of 593 AVC teachers across the vocational training program areas and programs completed GSIQs, and each GSIQ was usable.

### Data Analysis

The data obtained from the GSIQs were analyzed individually and collectively by program area, program, skill area, and skill. Descriptive statistics were used to analyze, explain, and discuss the data. Means, standard deviations, sample sizes, and reliability coefficients were computed using the Statistical Packages for the Social Sciences (SPSS) (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975).



The reliability of the GSIQ was determined in terms of internal consistency reliability. Internal consistency reliability generally refers to the consistency or homogeneity of performance over all items on an instrument or scale within an instrument (Nunnally, 1978). The coefficient of internal consistency indicates the degree to which the items intercorrelate. Thus, the higher the coefficient of internal consistency, the greater is the instrument's capability of consistently and accurately measuring the trait(s) which it intends to measure. The rationale for these analyses suggested that if the teachers were rating the skills accurately and consistently, there should be high internal consistency reliability coefficients for the Generalizable Skills Importance Questionnaire within and across vocational training program areas. Cronbach's Coefficient Alpha (Cronbach, 1971) which is based on the average correlation among items within an instrument was used to estimate the internal consistency of the GSIQ. Internal consistency reliability coefficients of .80 or greater for measuring instruments are usually considered adequate (Nunnally, 1978). Therefore, for this study, an individual skill area or total instrument coefficient of .80 or larger was considered adequate and acceptable.

The GSIQs provided descriptive data which related the relative importance, as perceived by vocational teachers, of a list of skills in terms of being necessary for students to successfully perform in the vocational training programs in which they were enrolled. The teachers' responses from the seven-point importance scale which used three anchors (not important, moderately important, very important) were collectively translated into levels of skill generalizability and need that included: (a) low,  $\bar{x}=1.00-2.99$ , (b) medium,  $\bar{x}=3.00-5.00$ , and (c)





high,  $\bar{x}=5.01-7.00$ . Thus, the levels of skill generalizability and need were identified and described within and across program areas, programs, skill areas, and skills.

### Results

The general findings and conclusions of this study include:

1. The process for identifying the list of generalizable skills was based on a logical plan that included a comprehensive review of the literature, identification of an item pool, analysis and synthesis of items from the pool, and reviews and evaluations of the list by a panel of experts.
2. The GSIQ instrument construction process was based on a logical plan including the selection of the identified list of generalizable skills, development of an appropriate scale for the intended purpose, writing and scaling the items, and writing directions for using the instrument.
3. The internal consistency reliability coefficients for the GSIQ ranged from .90 to .98. These values suggested that the GSIQ skill areas and items, individually and collectively, were very highly accurate and consistent measures of skill generalizability and need. All coefficients were well above .80 and therefore considered adequate and acceptable. The findings suggested that the GSIQ mathematics, communications, interpersonal relations, and reasoning skill areas and skills are reliable measures of generalizable skills within and across secondary agricultural; business, marketing, and management; health; home economics; and industrial occupations vocational training programs.
4. There is a core of mathematics, communications, interpersonal relations, and reasoning skills which are generalizable within and across secondary agricultural; business, marketing, and management; health; home economics; and industrial occupations training programs (See Table 1).

### Implications

Vocational education has become increasingly aware of the need to provide all students with appropriately designed individualized instruction and support services necessary to succeed in vocational programs. Students frequently enroll in vocational programs with below average proficiencies in skill areas, such as, reading and mathematics. Typi-



cally, vocational students' skill levels may be one (1) standard deviation below the entire student population. At the same time, reading, mathematics, and other skills may be very important to succeed in vocational training programs and occupations.

Although students may continue to acquire the essential vocational/technical competencies for a given occupation, in many instances they may be unsuccessful in completing their vocational programs and not increase their proficiencies in the generalizable or "basic skill" areas. In addition, vocational education (and other fields) has often used skills and standardized tests to classify students, assess students' learning problems, and guide curriculum development. These tests and procedures frequently have had a questionable relationship to the content of vocational programs. Thus, their reliability and validity are suspect regarding usefulness and application for vocational students and school personnel.

This study attempted to identify those generalizable skills which are basic to, necessary for success in, and transferable or common within and/or across secondary vocational training program areas and programs. The expectation is that the results of this study will provide vocational teachers, administrators, counselors, and other school personnel with information regarding the generalizable skills requirements in vocational training programs. The information should assist in individualized program assessment, planning, implementation, and evaluation. School personnel will become aware and should begin or continue to deal with the problem of providing students with the necessary instruction and support services to successfully complete vocational programs and enter occupations.



This study also provides a basis for eventual development of functional assessment procedures and strategies with which students, teachers, and other school personnel can measure students' generalizable skill levels. The subsequent procedures and instruments could assess learning abilities or diagnose difficulties, and identify those students who may have functional learning problems. The information from such assessments could suggest instructional needs, and provide a basis for determining and delivering the appropriate support services students need to succeed in their chosen vocational programs.





TABLE 1

Generalizability of Mathematics, Communications, Interpersonal Relations, and Reasoning Skills in Secondary Agricultural; Business, Marketing, and Management; Health; Home Economics; and Industrial Occupations Training Programs.



## omics Occs.

[illegible][illegible]



[illegible]



## Areas and Programs

### Economics Occs.

## Industrial Occupations

[illegible]

**ALL VOCATIONAL TRAINING AREAS AND PROGRAMS**



[illegible]



## as and Programs

## ics Occs.

[illegible]



[illegible]



## Means and Programs

[illegible]



[illegible]



Economics Occs.										Industrial Occupations									
Interior Decorating										Air Conditioning									
Child Development										Heating									
Cooperative Work Training (CWT)										Appliance Repair									
All Home Economics Occupations Programs										Automotive Services									
										Body and Fender Repair									
										Auto Mechanics									
										Aircraft Maintenance									
										Commercial Art									
										Construction and Building Trades									
										Carpentry									
										Industrial Maintenance									
										Diesel Mechanic									
										Drafting									
										Electrical Occupations									
										Industrial Electrician									
										Electronic Occupations									
										Radio/Television Repair									
										Graphic Arts									
										Machine Shop									
										Combine Metal Trades									
										Welding									
										Tool and Die Making									
										Cosmetology									
										Refrigeration									
										Small Engine Repair									
										Millwork and Cabinet Making									
										Industrial Cooperative Education									
										Cooperative Work Training (CWT)									
										Truck Driving									
										Warehousing									
										Home Remodeling and Renovation									
										Custodial Maintenance									
										Communications and Media Specialist									
										All Industrial Occupations Programs									

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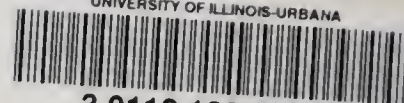


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